Alternative Narrowing Process

Western Delta Isolated Conveyance Facility

Alternative 3G

Alternative 3G, the Western Delta Isolated Conveyance Facility utilizes the Deep Water Ship Channel (DWSC), and a western Delta conveyance pipeline, tunnel and channel to convey 5,000 cfs from the intake on the Sacramento River near Sacramento to Clifton Court Forebay.

This alternative would use the DWSC as the upstream reach of the conveyance system. A new intake facility capable of diverting 5,000 cfs through "best feasible technology" fish screens would be constructed at the upstream end of the DWSC. Downstream of the screens, a low lift pump station would provide the hydraulic head to move 5,000 cfs through the channel during periods of insufficient head to flow by gravity alone. In order to maintain operations of the Port of Sacramento a ship lock would be constructed at the downstream end of the channel. Immediately upstream from the lock, a new unscreened pumping plant would lift water into a pressurized pipeline that follows the Sacramento River to a tunnel that crosses the Sacramento and San Joaquin Rivers to Brentwood. From there, an open canal conveys water to Clifton Court Forebay.

Modification to Remove Technical Problems

There were no major technical problems identified in alternative 3G.

Functionally Equivalent Conveyance

Except for the conveyance facilities intake location, type, and route this alternative and alternative 3B, a small east side isolated conveyance facility, are identical. The ability of both alternatives to meet the Program objectives are the same. Both alternatives propose new 5,000 cfs intakes with "best feasible technology" fish screens on the Sacramento River, North and South Delta Improvements, same volumes and graphical extent of new storage, CVP & SWP improvements, and similar operational policies.

The differences lie in the in the details of the isolated facility. Although the conveyance size and function of both alternatives are the same, the intake location, conveyance route, conveyance components, right-of-way, environmental impacts, and costs differ. These differences are discussed below:

Intake location

Fishery agency experts on in-Delta and anadromous fisheries were consulted to determine the difference in fishery benefits achieved between a diversion on the Sacramento River at Hood and one located at the Ship Channel entrance near Sacramento. It was determined that even though moving upstream to the ship channel entrance would reduce the impacts of tidal influence and be farther removed from in-Delta species habitat, there would be minor incremental benefits achieved for in-Delta species. The principle reason for this small difference is that the Delta smelt only move up into the vicinity of these diversions in dry years. Usually in these dry years there is little water available for diversion. For the small amount that is available the diversions can be managed to minimize the impacts on the Delta smelt. The small difference in tidal influence between the two diversion points also minimizes the impact differences between the two locations.

This alternative's intake is located upstream of the discharge of the Sacramento Regional Waste Water Treatment Plant. This offers a greater water quality benefit than alternative 3B whose intake is located at Hood downstream of the treatment plant. The discharge of the plant could be left in its present location or moved to a location downstream of the proposed intake at Hood if the benefit was great enough to offset the increased cost.

Conveyance Components

This alternative 3G uses the existing DWSC for the first 19 miles of the conveyance facility. Some of the possible benefits of this route are: a feeder line could be connected to North Bay service areas, thus possibly eliminating an in-Delta diversion; a possible future extension of the Tehama Colusa Canal could connect into the DWSC; and only minor modifications and impacts to the channel itself. In contrast, alternative 3B offers the benefit of possible feeder lines to east and southeast Delta service areas.

In order to maintain operations of the Port of Sacramento a ship lock would be constructed at the downstream end of the DWSC. The lock would prevent lower quality Delta water from entering the Ship Channel while continuing to allow large ship traffic in the channel. The locks could have some impact on shipping schedules for the Port. Some upstream fish migrants may stray into the Ship Channel through the locks.

An unscreened pumping plant would pump water from the Ship Channel into a 10.6 mile pressurized pipeline that follows the west bank of the Sacramento River. From the pipeline water would be conveyed via a 4.3 mile long tunnel under the Sacramento River, Sherman Island, and the San Joaquin River to a open canal near Brentwood. The approximately 16 mile long open canal would then convey the water to Clifton Court Forebay. The canal route offers the benefit of a possible connection to western delta service areas; however the route passes through one of the fastest urbanizing areas of the state.

Right-of-Way

The total right-of-way needed for this alternative 3G is 1,854 acres. Most of the conveyance route consists of existing Ship Channel. The right-of-way for the 44 mile long open canal option in alternative 3B would be include a total acreage of 5,330 acres. The impacted area in each option would be mitigated on a replacement of in kind land on a 1 to 1 acreage ratio.

Environmental Impacts

Although there are some unique tradeoffs in some of areas discussed above, on the surface the environmental impacts seam to only have slight differences for each conveyance method.

Costs Comparison

Major cost factors for the Western Delta Isolated Conveyance Facility in alternative 3G, include the intake, pump station, lock, pipeline, tunnel and canal. The most uncertain cost is in the construction of the 4 mile tunnel under the Sacramento and San Joaquin Rivers. The subsurface conditions are not known but it is assumed the tunnel would be bored through soft peat soils which underlie much of the western Delta. It is assumed that, current technology boring machines are capable of working in these conditions.

The following table compares the capital cost of the conveyance option alternative 3G to the conveyance option in alternative 3B. The costs were derived from the references listed in the table and were adjusted to include the mitigation acreage. Each item in the table includes contingencies and engineering, legal, and project administration costs.

Although the table displays a single number for comparison purposes, the costs are preliminary and should be expressed as a range of -10% to +35%.

Conveyance (5,000 cfs) ($Millions)		
Cost Item	**Alt 3G[1]**	**Alt 3B[2]**
Western Delta ICF DWSC (includes intake, screens, and pump station)	$686	
Western Delta ICF pipeline	992	
Western Delta ICF tunnel	462	

Conveyance (5,000 cfs) ($Millions)		
Western Delta ICF pipeline and canal	155	
Western Delta ICF Mitigation	19	
East side Open Canal Isolated Facility Intake Facilities (includes intake, screens, and pump station)		$198
East side Open Canal Isolated Facility Capital (includes bridges, siphons, and canal)		606
East side Open Canal Isolated Facility Mitigation		53
Total Estimated Capital Cost:	$2,314	$857

1) CALFED Bay-Delta Program, "DRAFT - Facility Descriptions and Updated Cost Estimates for a Western Delta Isolated Conveyance Facility", June 30, 1997
2) CALFED Bay-Delta Program, "DRAFT - Facility Descriptions and Updated Costs Estimates for Isolated Delta Conveyance Facility", March 28, 1997
3) Mitigation cost added on a 1:1 replacement ratio for the full right-of-way acreage

Even though the costs are preliminary the comparison shows that the western Delta isolated conveyance facility option costs substantially more than the eastern Delta open canal conveyance option.

Recommendation

Given that the alternatives 3G and 3B have functionally equivalent conveyance facilities, there is little environmental impact difference between the two alternatives, and the conveyance method in 3G costs 2 to 3 times that 3B, it is recommended that alternative 3B adequately represents the alternative concept and alternative 3G be dropped from consideration.